

CONTENTS PAGE

Client:	University of Bologna		
Quotation Number:	16875	Date:	15/05/2024
Job Number:	IN1365	Date:	03/07/2025

- ☒ 1 QUOTATION
- ☒ 2 CUSTOMER ORDER
- ☒ 3 MACHINE SPECIFICATION DOCUMENT_S027_v11
- ☒ 4 LOG SHEET_S028_v3
- ☒ 5 FAULT REPORTING DOCUMENT_S029_v3
- ☒ 6 TEST ACCEPTANCE SPECIFICATION_S030_v9
- ☒ 7 ASSEMBLY AND TEST RECORD_S023_v5
- ☒ 8 SERIAL NUMBER FORM_S053_v4
- ☒ 9 TEST DATA
- ☒ 10 PACKING LIST_S035b_v6
- ☒ 11 INSTALLATION REPORT_S057_v6
- ☒ 12 INSTALLATION ACCEPTANCE AND WARRANTY CERTIFICATE_S071_v3

ADDITIONAL:

Payment Terms:

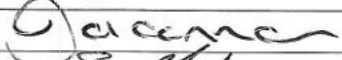
50% / 50%

Other: please specify

Penalty Clause Yes / No

Please specify:

Blue Book Completion:

Signed		Date	7/11/25
Verified		Date	9/4/26

Quotation

To: University of Bologna
 Dept. Agricultural and Food Sciences
 via Fanin 46
 Bologna
 I-40127

VAT No.

Quotation Date: 15/05/2024
Quotation Reference: 16875
Customer Ref:
Account Ref: UNI089
Quotation Validity: 20/12/2024

Quantity	Product Code	Product Description	Unit Price €	Discount €	Net Price €
Budgetary Proposal for LA-IRMS					
HS2022 IRMS					
1	20402/4	HS2022 + Hd Collector + E-Mag + Trap Loop Continuous flow isotope ratio mass spectrometer. Including high sensitivity source, electro magnet and HD collector Innovative trapping loop technology included, which allows the source to be tuned and delta values to be calculated without the need for a reference gas. System configured for m/z 28 to 64 for the analysis of H ₂ , CO ₂ , N ₂ , N ₂ O, NO, O ₂ , SO, SO ₂ , CO and CH ₄ (converted to CO ₂). Windows based data system. 70201-1 - Analyser spares kit includes a filament, copper gaskets, source tool kit, pump oil, snoop and ferrules	138,000.000	41,400.00	96,600.00
Cryoflex Laser Ablation System					
1	10802/8	CryoFlex (LA) Trace gas analyser optimised for connection to peripherals which require a cryogenic focussing module. Includes liquid nitrogen based trapping system, gas chromatography and a micro-combustion stage. Includes isoSell 100 sample chamber. 71001-1 Cryoprep Spares Kit	63,600.000	19,080.00	44,520.00
1	10802/9	IRMS Compatible 213 Laser IRMS compatible Variant of LSX-213G2+	150,000.000	45,000.00	105,000.00
1	INST	Installation and start up training at Customer's site	9,962.000	0.00	9,962.00
1	WARR2	2 year warranty	0.000	0.00	0.00
1	DAP	DELIVERED AT PLACE Excluding any local duties and taxes that may apply.	3,000.000	0.00	3,000.00

This quotation is issued in Euro

Total Net Amount	€	259,082.00
Total VAT Amount	€	0.00
Order Total	€	259,082.00

* The price quoted does not include any local taxes or duties
 See separate document for terms and conditions

Payment Details:-

50% with order, 40% on delivery and 10% installation
 Payment is required within 30 DAYS of invoice date by bank transfer.
 All bank transfer charges are the responsibility of the customer.

Intra-community supply, subject to VAT in the country of acquisition.

Sercon Bank Details:-

National Westminster Bank, 36 High Street,
 Nantwich, Cheshire CW5 5GA U.K.

Sterling: IBAN: GB74NWBK54101736755133
 Euro: IBAN: GB14NWBK60721013806831
 US Dollar: IBAN: GB94NWBK60730113806556
 BIC: NWBKGB2LXXX

3 - MACHINE SPECIFICATION

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Ref No.	Product Description	Required
HS2022 (continuous flow)		
20402/1	HS2022 Ref Gas + P Mag	
20402/2	HS2022 Ref Gas + E-Mag	
20402/3	HS2022 Ref Gas + Hd Collector + E-Mag	
20402/4	HS2022 Ref Gas + Hd Collector+E-Mag+Trap Loop	
20501	Hd Collector Assy	***
50101/2	Trapping Loop Assy	
70201-1	70201-1 Analyser spares kit – Included	
EA Units		
10202/11	iso-EArth	
10202/13	iso-EArth+	
10202/14	iso-Earth HT Furnace Upgrade	
10202/15	Iso-Earth (Without Autosampler)	
11802/1	Earth+PC	
11802/2	EArth+Clarity+PC	
70501-1	Consumables for C and N for Combustion Only	
70501-11	Simultaneous CNS Consumables Kit (approx. 10000 analysis)	
70501-3	Sample Prep Kit (Inc.)	
70501-4	GSL Combustion and Gas C & N Start Up Kit	
70501-5	Simultaneous NCS Consumables Kit	
70501-6	C&N Combustion Only Consumables Kit (approx. 5000 samples)	
70501-8	Simultaneous CNS Consumables Kit (approx. 5000 samples)	
70601-1	Sulphur Start Up Kit (Inc. with Sercon EA Systems)	
70601-2	Sulphur Consumables Kit for 1000 Samples	
70601-4	Sulphur Consumables Kit (approx. 5000 Samples)	
70801-2	Pyrolysis Consumables Kit-Low temp for Solids	
71701-1	Sub Microgram Nitrogen Analysis Start Up Kit	
SI2040	PN150 Pneumatic Autosampler with one no.50 pos, carousel	
SI2345	ME Micro Balance	
SI2737/A	Sercon 50 Position Autosampler Assy	
SI2789	Extra 50 Position Carousel	
SI2744	Automatic Liquid Sampler 15 Position	
SI2743	Liquid Sampler Mounting Plate	
Headspace Equilibration		
10202/10	XYZ Gas Sampling Control Box	
10302/1	Aqua System	
11103	µCarbs for CF	
11103-1	µCarbs for DI	
11601	200 Place Dual Heated Block 240 Volt	
11801	Sercon XYZ Gas Autosampler	
71107-1	CF oxygen-18 equilibration kit	
71107-2	DI Oxygen-18 Equilibration kit	
71201-1	CF deuterium equilibration kit	
71201-2	DI Deuterium Equilibration kit	
71801-1	WES-DI start up kit (Inc. with WES-DI)	
GC Units		
10402/2	Orchid module 1500C (Will run Hd 70901-1 C Spares Kit Inc)	
10901	Nitrogen Option (71301-1 N Spares kit Included)	
HP7890/1	Agilent 7890B GC System	
HP7890/2	Agilent 7890B GC with Auto Injector	
HP7890/3	Agilent 7890B GC + Auto Injector + 150 Vial Sample Tray	
SI2561	Nexis GC 2010 Plus	

Ref No.	Product Description	Required
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S027_v11

Page 1 of 6

*** When ordered alone IN no. / Blue book NOT required

23/10/2017

3 - MACHINE SPECIFICATION

Client:	University of Bologna		
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GC Units *continued*

SI2564	Nexis GC-2030	
70901-3	GC Pyrolysis H and O Start Up Kit	
70901-4	GC Pyrolysis H Spares Kit	
70901-5	GC Combustion C Spares Kit (approx. 5000 samples)	
70901-6	GC Pyrolysis h Start Up Kit (approx. 5000 samples)	
71301-1	GC N Spares kit	

ABCA2 Units

10502/1	ABCA2 Sercon XYZ Autosampler	
10602	ABCA2 Gas Box	
20602	Complete Sercon ABCA2 system	
20603	ABCA IR Analyser	
70101-1	ABCA2 spares kit (Inc. With ABCA2)	
70101-2	ABCA2 Spares Kit for AB Analitica Systems	
70101-3	ABCA2 Autosampler Upgrade Kit	
SI1767	CVL505 – Barcode Reader	
SC9973	13C Urea breath test kit for Helicobacter pylori infection	
SC9974	Helicobacter Test kit for children age 3-11 (45mg)	

Integra2 Units

20802/4	Integra2	
70201-2	Integra2 analyser spares kit - Included	
70401-1	Integra-2 consumables (Inc. With Integra2)	

Trace Gas Systems

10802/4	CryoPrep	
10802/5	Automated LN refiller	
10802/6	CryoFlex (TOC)	
10802/7	CryoGas	
10802/8	CryoFlex (LA)	
SI2533	Silicon Carbide Vertical Furnace	
SI2731	213nm Laser Ablation System	
SI2733	isoScell 100 sampler chamber	
71001-1	Cryoprep Spares Kit	
71001-5	CryoGas Consumables Kit	

TOC Units

14001	Thermalox Environmental TOC-IRMS	
14002	Thermalox Environmental TOC-Standalone	
14003	Thermalox Environmental TOC-Standalone No Sampler	
SI2772	CO2 Detector, High sensitivity Option	
SI2773	NOx detector Option	
SI2774	Vacuum pump Option	
SI2775	Stirred Vial rack Option	
72101-1	TOC Start Up Kit	
72101-2	TOC Chem Pack	
72101-3	TOC & TN Instrument with heavy usage - one year	
72101-4	TOC only - economy holding	

GEO 20-22 (dual inlet)

10702	GEO 20-22 Water Equilibration System (D & 18O)	
21802/1	GEO 20-22	
21802/2	GEO 20-22 + E-Mag	
21802/3	GEO 20-22 + E-Mag +Hd	
21802/4	GEO 20-22 Inlet	

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70301-1	GEO start up kit - Included	
70301-3E	Comprehensive GEO 20-22 spares kit for 5 years operation	
HT-EA		
11501/4	HT-EA (With Autosampler)	
11501/5	HT-EA With Liquid Option	
11501/6	HT-EA Stand Alone	
11501/7	HT-EA (Without Autosampler)	
SI2622	CTC PAL3-LSI-L-S	
SI2624	CTC PAL3-Kit-Standalone	
70801-1	Pyrolysis Consumables Kit-High Temp for Solids	
71501-1	HT-EA Pyrolysis Start Up kit O and H	
71501-2	HT-EA Pyrolysis Kit for Water injections	
71501-3	HT-EA Sensitivity Start Up Kit for O & H in small samples	
71501-4	HT-EA Sensitivity Consumables Kit for O & H in small samples	
71501-5	HT-EA Sensitivity Kit for O&H in Small Samples (5000 samples)	
71501-7	HT-EA Kit for Room Temp Equilibration	
71501-8	HT-EA Pyrolysis Kit for Water injections (approx. 1 year kit)	

Ref No.	Product Description	Required
Upgrades		
12101	Evacuation System ***	
12102	2 Ref Gas+ Dilutor Box ***	
20101	Standard Source Assy ***	
20102	HS Source Assy ***	
20301	Standard Collector Assy ***	
30202/1	System Control Upgrade (Pmag) installation not included	Edwards Or Pfeiffer
30202/2	System Controller Upgrade (Emag) installation not included	Edwards Or Pfeiffer
10202/7	Preparation PCB Upgrade	
30202/3	Hijack Box ***	
30302/4	nEXT85 Edwards Pumping System Upgrade Single - installation not included	
30302/5	nEXT85 Edwards Pumping System Upgrade Dual - installation not included	
30302/6	nEXT85 Edwards Pumping System Upgrade Triple- installation not included	
SI2542	ABCA2 Upgrade Kit	
CALLISTOW	Callisto software upgrade ***	
Specials		
11702	LC-I interface	
12202	Leco Interface Unit	
SI2320	Agilent 1260 Series Refractive Index Detection HPLC System	
71401-1	ABCA-G Start Up/Spares Kit	
71401-2	ABCA-G Equilibration Spares Kit - Room temp O only	
71401-3	ABCA-G Equilibration Spares Kit - Room Temp O & H	
71601-1	LC Interface Spares Kit	
ADDITIONS		
PC	Windows 7 based PC System with Callisto Software	
Printer	Printer	
INST1	Installation and start up training at customer's site by Sercon Engineer	
INST2	Installation and start up training at customer's site by Agents Engineer	
WARR	1 year warranty	
WARR2	2 year warranty	
TRAIN	Training in UK for one person for 3 days	
SCONTRACT	Maintenance Service Contract - 1 year	
SPECIFICATION REQUIREMENTS		
Voltage	Volts 50/60Hzs	

3 - MACHINE SPECIFICATION

Client:

University of Bologna

Quotation Number:

16875

Date:

15/05/2024

Job Number:

IN1365

Date:

03/07/2025

Plug Type	SI2510	3 Metre USA/Japan plug to IEC C 13	
	SI2511	2.5 Metre Australian plug to IEC C 13	
	SI2512	3 Metre UK 13 amp Fused plug to IEC C 13	
	SI2523	3metre Schuko (Euro) Plug to IEC C13 Socket	
	SI2514	2.5 metre Chinese mains to IEC C13	
Pallet	Stamped for export heat treated for 30 min @ 56 °C		
	Complies with all Export Requirements		



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[illegible]

4 - LOG SHEET

Client:	UNIVERSITY OF BOLOGNA		
Quotation Number:	16875	Date:	15/5/24
Job Number:	1N1365	Date:	3/7/25

Date	Action Taken	By Whom
11/6/25	QUALITY CHECKED + P.A.T TESTED	PH.
26/6/25	Crimp on nitrogen set to ~40ml/min He control valve set to 10ml/min GC installed & ~5ml/min coming through output Pressure test PASS Background of ~3E-10 reduced to E-11 by tightening GC nut / replacing ferrules.	
26Jun25	Issue with flow becoming blocked while valves actuated.	
26Jun25	Investigated issue. Valves air inlets plumbed back to front - resolved.	DJH
26Jun25	Blockage found in valves. Seems to be moving causing different times to be some blocked at different times. Replaced valves and replaced for new flows now correct.	DJH
26Jun25	Flow low through GC column. Pressure required to be set high 25psi for 3ml/min exit flow through GC column. Column to be baked out and flows reset overnight.	DJH
27Jun25	Batch run over night. Results initially good but Sens dropped out on samples towards end of batch. Investigated GC column, leak found. Replaced ferrules + lowered the pressure. Peak response now much higher for Cryo trapped Ref gas. Lowered Trap + reduced to 1 sec pulse (down from 5 sec).	DJH

Date	Action Taken	By Whom
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4 - LOG SHEET

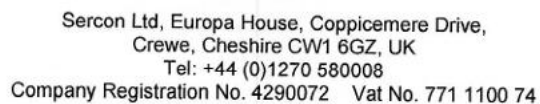
Client:	UNIVERSITY OF BOLOGNA		
Quotation Number:	16875	Date:	15/5/24
Job Number:	IN1365	Date:	3/7/25

Date	Action Taken	By Whom
17/4/25	UNIT SWAPPED WITH IN1356.	PH
22/4/25	UNIT PURGED DOWN WITH 67HOU A-2.4e-8 - S-1.0e-8.	PH.
13.5.25	Gases hooked up, crimps set and Source turned on	HC/TI
14.5.25	Ref gas Specs beginning to run.	
22.5.25	New design Emag put on to unit, peak shapes found and Specs run	SM
27.5.25	All Specs pass for C and N. Continuing with prep unit Setup	AD
28.5.25	Leak on trapping loop, finding where. Dewy Seal added to valve 9, pressure test passes	AD
5.6.25	Magnet marked up, replaced for Pmag to find Sulphur. Sulphur found, Emag back on and re ran Specs - all ok	AD
9.6.25		
14.6.25	left in HD mode over weekend, ran ref gas precision - pass	AD
19.6.25	Filament changed due to high emissions	AD
20.6.25	Filament changed again coating not stamped on after conditioning	AD

Date	Action Taken	By Whom
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4 - LOG SHEET

Client:			
Quotation Number:		Date:	
Job Number:		Date:	
23/6/15	Source still not very good sens or tuning. Swapped for bested source in back rig CO ₂ ref gas passes precision and linearity	AD	
26/6/25	V5 Isolation Valve Swapped out since it wasn't closing properly (needed to be pushed in). New ISO valve never reached full vacuum so V8 was swapped in & V5 & trapping loop blanked. New ISO valve on V8 was made from sanctioning parts of previous two valves on V5. Lower flow than expected from Cryo caused by blockage in trap line between flow meter & V5. Line blown out & flow increased. Longer pigtail made & slightly reduced background from cryo out of V5.	HC	
Date	Action Taken	By Whom	

19/01/2017



Sercon Ltd, Europa House, Coppicemere Drive,
Crewe, Cheshire CW1 6GZ, UK
Tel: +44 (0)1270 580008
Company Registration No. 4290072 Vat No. 771 1100 74

Test acceptance - 6

6 - TEST / ACCEPTANCE SPECIFICATION

Customer:	UNIVERSITY OF BOLAGNA		
Quotation Number:	16875	Date:	15/5/24
Job Number:	IN1365	Date:	3/7/25

HS20-22				
Reference Gas Precision (n=5) x5 Ref gas pulses of 5 seconds to be used.				
¹³ C	(CO ₂)	0.06	0.03	✓
¹⁵ N		0.06	0.03	✓
¹⁸ O	(CO ₂)	0.06	0.05	✓
³⁴ S	(SO ₂)	0.1		
² H		0.4	0.16	✓

Reference Gas Linearity ref gas pulses ranging from 1-second trough to 10 seconds		
¹³ C	≤0.02‰/nA STD Deviation <0.30	
¹⁵ N	≤0.02‰/nA STD Deviation <0.30	

IsoEarth & PyroEarth					
Combustion (n=5) (For NCS use 0.3mg of Cystine) (Pyrolysis use silver caps) 0.4mg of Cystine for ¹⁸ O and 4 mg of Cystine for H ₂					
¹³ C	100 µg C	0.1		10 µg C	0.8
¹⁵ N	100 µg N	0.15		10 µg N	1.5
³⁴ S	25 µg S	0.3		10 µg S	1.0
Dual	400 µg C	0.1		100 µg N	0.15
¹⁸ O	100 µg or 1 µl water	0.3			
² H	200 µg H or 1 µl water	1.0			

6 - TEST / ACCEPTANCE SPECIFICATION

Customer:			
Quotation Number:		Date:	
Job Number:		Date:	

EArth			
Solid specs to be completed using 2mg methionine calibration against 1,2,3mg (n=3) cystine. Combustion (n=5)			
		Accuracy (avg)	Precision (std dev)
¹³ C		+/- 0.4%	0.2
¹⁵ N		+/- 0.4%	0.2
² H		+/- 0.4%	0.2
³⁴ S		+/- 0.4%	0.2
¹⁸ O	Pyrolysis	+/- 0.4%	0.2
Liquid injections n=5 using 5µl methanol calibrated against 2,4,6µl injections of ethanol			
		Accuracy (avg)	Precision (std dev)
¹⁸ O	Pyrolysis	+/- 0.4%	0.2

Integra2			
Specs to be completed using AS beet mix 400C/100N for precision & 250C/100N for linearity			
¹³ C	100 µg C	0.2	
¹⁵ N	100 µg N	0.3	
Dual	100 µg N & 400 µg C	0.4 & 0.15	
³⁴ S	30 µg S	0.5	
¹⁸ O	100 µg O	0.5	
Dual	100 µg N & 250 µg C	0.5	
HT-EA (Pyrolysis use silver caps)			
0.4mg of Cystine for ¹⁸O and 4 mg of Cystine for H₂			
Pyrolysis (n=5)			
¹⁸ O	100 µg O or 1 µl water	0.3	
² H	200 µg H or 1 µl water	1.0	

6 - TEST / ACCEPTANCE SPECIFICATION

Customer:			
Quotation Number:		Date:	
Job Number:		Date:	

Aqua, μ Carbs & GasBox					
Equilibrations (n=5)					
^{18}O	0.2 ml water	0.1			
^2H	0.2 ml water	2.0			
Carbonates (n=5)					
^{13}C	100 μg CaCO_3	0.08			
^{18}O	100 μg CaCO_3	0.1			
Gas Analysis (n=5)					
^{13}C	5% CO_2	0.1		Air CO_2	0.1
^{18}O	5% CO_2	0.1		Air CO_2	0.2
^2H	0.5 ml H_2	1.5			
^{15}N	0.5 ml N_2	0.1		100 ppm N_2O	0.5
^{13}C	Breath (12 ml)	0.1			
DIC (n=5)					
^{13}C	15ppm (0.5ml)	0.15			

LC-I					
(n=5)					
^{13}C		0.2			

GC Orchid					
Combustion (n=3 for each analyte)					
^{13}C	3 Alkanes	100 ng C	0.2	10 ng C	0.5
^{15}N	2 Amines	100 ng N	0.5	14 ng N	1.5

6 - TEST / ACCEPTANCE SPECIFICATION

Customer:			
Quotation Number:		Date:	
Job Number:		Date:	

Pyrolysis (n=3 for each analyte)							
² H	3 Alkanes	250 ng H	3.0		25 ng H	10.0	
¹⁸ O	3 FAMES	100 ng O	0.5		20 ng O	2.0	
Water pyrolysis (n=5)							
² H	0.1 µl water	3.0					
¹⁸ O	0.1 µl water	0.4					

CryoRange							
(n=5)							
¹³ C	Air CO ₂ (12ml)	0.1		Air CH ₄ (125ml)	0.2		
¹⁵ N	Air N ₂ (1ml)	0.1		Air N ₂ O (125ml)	0.4		
¹⁸ O	Air CO ₂ (12ml)	0.15		Air N ₂ O (125ml)	0.7		
¹⁸ O	Air O ₂ (1ml)	0.1					
² H	Air CH ₄	3.0					
¹³ C	TOC (5ppm)	0.4					
¹³ C	Laser						

Geo2							
Internal precision (no change overs)							
² H	200 Bar µl	0.15					
¹³ C	100 Bar µl	0.01					
¹⁵ N	100 Bar µl	0.01					
¹⁸ O	100 Bar µl	0.015					
³⁴ S	100 Bar µl	0.015					
Single cold finger volumes (10 change overs)							

6 - TEST / ACCEPTANCE SPECIFICATION

Customer:			
Quotation Number:		Date:	
Job Number:		Date:	

¹³ C	20 Bar µl	0.01	
¹⁸ O	20 Bar µl	0.015	
¹³ C	3 Bar µl	0.02	
¹⁸ O	3 Bar µl	0.03	
CAPS (n=5)			
¹³ C	50 µg CaCO ₃	0.03	
¹⁸ O	50 µg CaCO ₃	0.06	
WES (n=5)			
² H		1.0	
¹⁸ O		0.05	
Manifold (10 tubes)			
² H		0.5	
¹³ C		0.02	
¹⁵ N		0.02	
¹⁸ O		0.03	
³⁴ S		0.03	

Special tests



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Crewe, Cheshire CW1 6GZ, UK
Tel: +44 (0)1270 580008
Company Registration No. 4290072 Vat No. 771 1100 74

Test acceptance - 6

6 - TEST / ACCEPTANCE SPECIFICATION

Customer:			
Quotation Number:		Date:	
Job Number:		Date:	

Sales Signature: <i>G. O'Connor</i>	Date: <i>30/6/25</i>
Test Signature: <i>AB</i>	Date: <i>30/6/25</i>

6 - TEST / ACCEPTANCE SPECIFICATION

Customer:	University of Bologna		
Quotation Number:	16875	Date:	15/05/2024
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HS20-22

Reference Gas Precision (n=5) x5 Ref gas pulses of 5 seconds to be used.

¹³ C	(CO ₂)	0.06	
¹⁵ N		0.06	
¹⁸ O	(CO ₂)	0.06	
³⁴ S	(SO ₂)	0.1	
² H		0.4	

Reference Gas Linearity ref gas pulses ranging from 1-second trough to 10 seconds

¹³ C	≤0.02‰/nA STD Deviation <0.30	
¹⁵ N	≤0.02‰/nA STD Deviation <0.30	

IsoEarth & PyroEarth

Combustion (n=5) (For NCS use 0.3mg of Cystine) (Pyrolysis use silver caps) 0.4mg of Cystine for ¹⁸O and 4 mg of Cystine for H₂

¹³ C	100 µg C	0.1		10 µg C	0.8	
¹⁵ N	100 µg N	0.15		10 µg N	1.5	
³⁴ S	25 µg S	0.3		10 µg S	1.0	
Dual	400 µg C	0.1		100 µg N	0.15	
¹⁸ O	100 µg or 1 µl water	0.3				
² H	200 µg H or 1 µl water	1.0				

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EArth			
Solid specs to be completed using 2mg methionine calibration against 1,2,3mg (n=3) cystine. Combustion (n=5)			
		Accuracy (avg)	Precision (std dev)
¹³ C		+/- 0.4%	0.2
¹⁵ N		+/- 0.4%	0.2
² H		+/- 0.4%	0.2
³⁴ S		+/- 0.4%	0.2
¹⁸ O	Pyrolysis	+/- 0.4%	0.2
Liquid injections n=5 using 5µl methanol calibrated against 2,4,6µl injections of ethanol			
		Accuracy (avg)	Precision (std dev)
¹⁸ O	Pyrolysis	+/- 0.4%	0.2

Integra2			
Specs to be completed using AS beet mix 400C/100N for precision & 250C/100N for linearity			
¹³ C	100 µg C	0.2	
¹⁵ N	100 µg N	0.3	
Dual	100 µg N & 400 µg C	0.4 & 0.15	
³⁴ S	30 µg S	0.5	
¹⁸ O	100 µg O	0.5	
Dual	100 µg N & 250 µg C	0.5	
HT-EA (Pyrolysis use silver caps) 0.4mg of Cystine for ¹⁸ O and 4 mg of Cystine for H ₂			
Pyrolysis (n=5)			
¹⁸ O	100 µg O or 1 µl water	0.3	
² H	200 µg H or 1 µl water	1.0	

6 - TEST / ACCEPTANCE SPECIFICATION

Customer:	University of Bologna		
Quotation Number:	16875	Date:	15/05/2024
Job Number:	IN1365	Date:	03/07/2025

Aqua, μ Carbs & GasBox					
Equilibrations (n=5)					
^{18}O	0.2 ml water	0.1			
^2H	0.2 ml water	2.0			
Carbonates (n=5)					
^{13}C	100 μg CaCO_3	0.08			
^{18}O	100 μg CaCO_3	0.1			
Gas Analysis (n=5)					
^{13}C	5% CO_2	0.1		Air CO_2	0.1
^{18}O	5% CO_2	0.1		Air CO_2	0.2
^2H	0.5 ml H_2	1.5			
^{15}N	0.5 ml N_2	0.1		100 ppm N_2O	0.5
^{13}C	Breath (12 ml)	0.1			
DIC (n=5)					
^{13}C	15ppm (0.5ml)	0.15			

LC-I					
(n=5)					
^{13}C		0.2			

GC Orchid					
Combustion (n=3 for each analyte)					
^{13}C	3 Alkanes	100 ng C	0.2	10 ng C	0.5
^{15}N	2 Amines	100 ng N	0.5	14 ng N	1.5

6 - TEST / ACCEPTANCE SPECIFICATION

Customer:	University of Bologna		
Quotation Number:	16875	Date:	15/05/2024
Job Number:	IN1365	Date:	03/07/2025

Pyrolysis (n=3 for each analyte)						
² H	3 Alkanes	250 ng H	3.0		25 ng H	10.0
¹⁸ O	3 FAMES	100 ng O	0.5		20 ng O	2.0
Water pyrolysis (n=5)						
² H	0.1 µl water	3.0				
¹⁸ O	0.1 µl water	0.4				

CryoRange						
(n=5)						
¹³ C	Air CO ₂ (12ml)	0.1		Air CH ₄ (125ml)	0.2	
¹⁵ N	Air N ₂ (1ml)	0.1		Air N ₂ O (125ml)	0.4	
¹⁸ O	Air CO ₂ (12ml)	0.15		Air N ₂ O (125ml)	0.7	
¹⁸ O	Air O ₂ (1ml)	0.1				
² H	Air CH ₄	3.0				
¹³ C	TOC (5ppm)	0.4				
¹³ C	Laser					

Geo2						
Internal precision (no change overs)						
² H	200 Bar µl	0.15				
¹³ C	100 Bar µl	0.01				
¹⁵ N	100 Bar µl	0.01				
¹⁸ O	100 Bar µl	0.015				
³⁴ S	100 Bar µl	0.015				
Single cold finger volumes (10 change overs)						

6 - TEST / ACCEPTANCE SPECIFICATION

Customer:	University of Bologna		
Quotation Number:	16875	Date:	15/05/2024
Job Number:	IN1365	Date:	03/07/2025

¹³ C	20 Bar µl	0.01	
¹⁸ O	20 Bar µl	0.015	
¹³ C	3 Bar µl	0.02	
¹⁸ O	3 Bar µl	0.03	
CAPS (n=5)			
¹³ C	50 µg CaCO ₃	0.03	
¹⁸ O	50 µg CaCO ₃	0.06	
WES (n=5)			
² H		1.0	
¹⁸ O		0.05	
Manifold (10 tubes)			
² H		0.5	
¹³ C		0.02	
¹⁵ N		0.02	
¹⁸ O		0.03	
³⁴ S		0.03	

Special tests



sercon
innovators in isotopes

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Crewe, Cheshire CW1 6GZ, UK
Tel: +44 (0)1270 580008
Company Registration No. 4290072 Vat No. 771 1100 74

Test acceptance - 6

6 - TEST / ACCEPTANCE SPECIFICATION

Customer:	University of Bologna		
Quotation Number:	16875	Date:	15/05/2024
Job Number:	IN1365	Date:	03/07/2025

Sales Signature: <i>[Signature]</i>	Date: <i>8/9/25</i>
Test Signature: <i>[Signature]</i>	Date: <i>8/9/25</i>

7: ASSEMBLY AND TEST RECORD

Client:	Uni of Bologna		
Quotation Number:	16875	Date:	15/05/2024
Job Number:	1N1365	Date:	3/07/2025

PRODUCT:

CRYOPUR LA

SERIAL NUMBER:

108028-2025-1365

ASSEMBLED:
(Name)

Mu

Date:

14/5/25

PRE-TEST
INSPECTION:
(Production name)

P. Hays

Date:

11/6/25

PRE-TEST
INSPECTION:
(Test name)

AS

Date:

11/6/25

SYSTEM TEST:
(Name)

AS

Date:

30/6/25

PRE-DESPATCH
INSPECTION:
(Name)

Hays

Date:

10/09/25

P.A.T. Test results

In compliance with Low Voltage directive 73/23/EEC
To Low Voltage standard EN61010 – 1:1993

Earth Continuity

0.071

Ω

Insulation

> 300

MΩ

Earth Leakage Current

0.80

mA. @

0.05

kVA.

Tested by:

P. Hays

Date:

11/6/25

7: ASSEMBLY AND TEST RECORD

Client:	University of Bologna		
Quotation Number:	16875	Date:	15/05/2024
Job Number:	IN1365	Date:	03/07/2025

(STODOR)

PRODUCT:

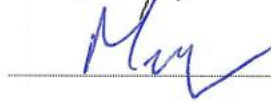
MS2022

SERIAL NUMBER:

 20402/4-2025/1386⁶⁵

PH. 7/7/25

 ASSEMBLED:
 (Name)



Date:

2/4/25

 PRE-TEST
 INSPECTION:
 (Production name)



Date:

2/4/25

 PRE-TEST
 INSPECTION:
 (Test name)



Date:

2/4/25

 SYSTEM TEST:
 (Name)



Date:

30/6/25

 PRE-DESPATCH
 INSPECTION:
 (Name)



Date:

10/9/25

P.A.T. Test results

 In compliance with Low Voltage directive 73/23/EEC
 To Low Voltage standard EN61010 - 1:1993

Earth Continuity

0.085 Ω

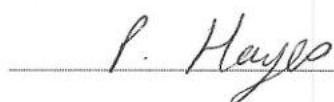
Insulation

> 300 MΩ

Earth Leakage Current

0.25 mA @ 0.05 kVA

Tested by:



Date:

2/4/25

8 - Serial Numbers Record Document

Client:	University of Bologna		
Quotation Number:	16875	Date:	15/05/2024
Job Number:	IN1365	Date:	03/07/2025

Units	S/N
MS/ABCA	20402/4-2025/1365
Integra 2	
Prep Unit 1	10802/8-2025/1365
Prep Unit 2/Misc	
Electronics Upgrade	
CETAC	
Gas Box	
Autosampler	
BCR	
Dual Heater Block	

Pump Kit and Optics	S/N
Turbo pump S	250077926
Turbo pump A	250077500
Rotary Pump	260027424
Voltage	110 / (240)
Gauge S	250009659
Gauge A	250009661
Source	20102HS-254
Collector 1	20301-170
Collector 2	20501-077
Magnet	SERCON #153 #155

Parts	S/N
Fan PSU	
24V PSU	

PCBs	S/N
Electronics Box	20250001
Prep PCB	✓
VFC PCB	Fixed (?)
Watchdog PCB	✓
Head Amp PCB 1	24027
Head Amp PCB 2	22001
Electromagnet RP	Fixed (?)

Furnaces	S/N
Combustion	
Reduction	
HT-EA	
GC Oven	
Furnace 1	3868/06/25 (Elite)
Furnace 2	

PC	S/N
PC	DOY H204
Monitor	16FX1174
Printer	

Key

Pumps:	E: Edwards P: Pfeiffer
Furnaces:	V/S: Vecstar E: Elite
Magnet:	E: Electromagnet S: Standard
Turbos & Gauges:	S: Source A: Analyser
Collectors:	Std: Standard S: Sulphur HD: Hydrogen Deuterium

Additional System Info:

~~FURNACE 3857/04/25~~ SENT TO IN1359.

Packing List

Customer Reference: CIG B4AE010DF1

Shipper / Exporter:

Sercon Limited
Europa House
Coppicemere Drive
Crewe
CW1 6GZ
UK

Tel: +44 (0)1270 580008
Reference: IN1365

Consignee:

University of Bologna
Dept. Agricultural and Food Sciences
DISTAL - Via Fanin 40, 40127, Bologna
First Floor, PAL 475-475-WP01-099
ITALY
e-mail: r.guerrieri@unibo.it

Contact Name: Rossella (Maria Rosa) Guerrier
Contact Tel Number: +39-379-1180790
Contact Name: Paola Gioacchini
Contact Tel Number: +39- 329-9295879

BOX: 1

Quantity	Product Code	Product Description	Serial Number: if available
☒ 1	20402/4	HS2022	20402/4-2025/1365

Packed by:

P. Hayp.

Date:

10/9/25

Claims for damage or shortages must be made within 3 days

Packing List

Customer Reference: CIG B4AE010DF1

Shipper / Exporter:

Sercon Limited
Europa House
Coppicemere Drive
Crewe
CW1 6GZ
UK

Tel: +44 (0)1270 580008
Reference: IN1365

Consignee:

University of Bologna
Dept. Agricultural and Food Sciences
DISTAL - Via Fanin 40, 40127, Bologna
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ITALY
e-mail: r.guerrieri@unibo.it

Contact Name: Rossella (Maria Rosa) Guerrier
Contact Tel Number: +39-379-1180790
Contact Name: Paola Gioacchini
Contact Tel Number: +39- 329-9295879

BOX: 2

Quantity	Product Code	Product Description	Serial Number: if available
☒ 1	10802/8	CRYOFLEX (LA)	10802/8-2025/1365

Packed by:

P. Hagg

Date:

10/9/25

Claims for damage or shortages must be made within 3 days

Packing List

Customer Reference: CIG B4AE010DF1

Shipper / Exporter:

Sercon Limited
 Europa House
 Coppicemere Drive
 Crewe
 CW1 6GZ
 UK

Tel: +44 (0)1270 580008
 Reference: IN1365

Consignee:

University of Bologna
 Dept. Agricultural and Food Sciences
 DISTAL - Via Fanin 40, 40127, Bologna
 First Floor, PAL 475-475-WP01-099
 ITALY
 e-mail: r.guerrieri@unibo.it

Contact Name: Rossella (Maria Rosa) Guerrier
 Contact Tel Number: +39-379-1180790
 Contact Name: Paola Gioacchini
 Contact Tel Number: +39- 329-9295879

BOX: 3

Quantity	Product Code	Product Description	Serial Number: if available
☒ 1		ROTARY PUMP WITH FILTER	260027424
☒ 1		MAGNET WITH FEET.	
☒ 1	SI0219	DEWER	
☒ 1	SI1198	RT-Q-BOND COLUMN	
☒ 1	SI2918	PC	DOYHZ04
☒ 1	SI2391	MONITOR	16FXH74
☒ 1		SOFTWARE BACKUP USB	
☒ 1		WINDOWS RECOVERY USB	
☒ 1		ELECTRONIC MANUALS ON SOFTWARE BACKUP USB	
☒ 1		LASER CABLE	
☒ 4		EURO MAINS CABLES	
☒ 1	70201-1	ANALYSER SPARES KIT	
☒ 1	71001-6	CRYOFLEX LA (START UP KIT)	
☒ 1	13001/1	IsoScell	

Packed by: P. Hays

Date: 10/9/25.

Claims for damage or shortages must be made within 3 days

Packing List

Shipper / Exporter:

Sercon Limited
Europa House
Coppicemere Drive
Crewe
CW1 6GZ
UK

Tel: +44 (0)1270 580008
Reference: IN1365

Customer Reference: CIG B4AE010DF1

Consignee:

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Dept. Agricultural and Food Sciences
DISTAL - Via Fanin 40, 40127, Bologna
First Floor, PAL 475-475-WP01-099
ITALY
e-mail: r.guerrieri@unibo.it

Contact Name: Rossella (Maria Rosa) Guerrier
Contact Tel Number: +39-379-1180790
Contact Name: Paola Gioacchini
Contact Tel Number: +39- 329-9295879

BOX: 4

Quantity	Product Code	Product Description	Serial Number: if available
☒ 1	SI2506	Silicon Carbide Vertical tube furnace model TSV15/16/125	3868/06/25
☒ 1		Furnace Controller	

Packed by:

P. Hays

Date:

10/9/25

Claims for damage or shortages must be made within 3 days

Packing List

Customer Reference: CIG B4AE010DF1

Shipper / Exporter:

Sercon Limited
Europa House
Coppicemere Drive
Crewe
CW1 6GZ
UK

Tel: +44 (0)1270 580008
Reference: IN1365

Consignee:

University of Bologna
Dept. Agricultural and Food Sciences
DISTAL - Via Fanin 40, 40127, Bologna
First Floor, PAL 475-475-WP01-099
ITALY
e-mail: r.guerrieri@unibo.it

Contact Name: Rossella (Maria Rosa) Guerrier
Contact Tel Number: +39-379-1180790
Contact Name: Paola Gioacchini
Contact Tel Number: +39- 329-9295879

BOX: Dimensions and weights

	<u>L</u>		<u>W</u>		<u>H</u>		
Box 1	95	x	95	x	85	cm	gw 136 kg
Box 2	98	x	85	x	106	cm	gw 89 kg
Box 3	98	x	85	x	106	cm	gw 90 kg
Box 4	87	x	80	x	62	cm	gw 38 kg

Packing List

Customer Reference: CIG B4AE010DF1

Shipper / Exporter:

Sercon Limited
Europa House
Coppicemere Drive
Crewe
CW1 6GZ
UK

Tel: +44 (0)1270 580008
Reference: IN1365

Consignee:

University of Bologna
Dept. Agricultural and Food Sciences
DISTAL - Via Fanin 40, 40127, Bologna
First Floor, PAL 475-475-WP01-099
ITALY
e-mail: r.guerrieri@unibo.it

Contact Name: Rossella (Maria Rosa) Guerrier
Contact Tel Number: +39-379-1180790
Contact Name: Paola Gioacchini
Contact Tel Number: +39- 329-9295879

BOX: Dimensions and weights

	<u>L</u>		<u>W</u>		<u>H</u>		
Box 1	<u>95</u>	x	<u>95</u>	x	<u>85</u>	cm	gw <u>136</u> kg
Box 2	<u>98</u>	x	<u>85</u>	x	<u>106</u>	cm	gw <u>89</u> kg
Box 3	<u>98</u>	x	<u>85</u>	x	<u>106</u>	cm	gw <u>90</u> kg
Box 4	<u>87</u>	x	<u>80</u>	x	<u>62</u>	cm	gw <u>38</u> kg

11 – Installation Report

Client:	University of Bologna		
Quotation Number:	16875	Date:	15/05/2024
Job Number:	IN1365	Date:	03/07/2025

Contact:	Rossella Guerrieri, Paola Gioacchini		
Date of Visit:	3 rd – 7 th November 2025	No. of Days:	5
Engineer:	David Harris		

Details of visit:

Arrived on site with Teledyne engineer (James Hanson).

Unboxed instruments and setup on desktop. Desktop space is limited, furnace setup on side desk as required – All OK.

Unboxed PC, setup on desktop. Established comms with all instruments – All OK.

No issues with software. All components and controls are as expected – All OK.

Customer site facilities had not setup backline plumbing in lab. Tubing from gas cylinders not present, as wrong size ordered in error. Customer managed to acquire 1/8th copper tubing and fittings.

Issues with fitting lines to cylinders. Copper tubing is very soft plus not enough fittings for all cylinders. One connection damaged while fitting by user. Only helium and carbon dioxide gases required for installation. Gasses fitted to laser, 2022, & Cryo-LA from same cylinder – All OK.

Installed oil into rotary pump & fitted.

Pumped down instrument. Turbo-pump speeds reached 93k RPM. Vac pressure of 2.4×10^{-8} mBar achieved overnight. 1.0×10^{-8} mBar achieved over 2 days – All OK.

Activated Ion source & fired filament. No issues – All OK.

Setup Cryo-LA system. No faults noted. Plumbed in connections between systems as required – All OK.

JH of Teledyne installed laser (see Teledyne report for details).

Issue with trigger cable. Wiring does not match up to trigger laser fire from Callisto software. Rewired cable to connect appropriate electrical signal lines to System Controller. Cable now functions. Laser can be triggered via relay valve within HS2022 – All OK.

Fitted eMagnet. Issues with missing link cable. Made new cable and fitted. Issue resolved – All OK.

eMagnet responds as normal – All OK.

Installed high temp furnace on side desk due to size constraints. Furnace responds as normal. Heats up to 1000°C with no issues – All OK.

Demonstrated to users how to make up combustion tube and fit to system/furnace – All OK.

External engineer fitted air compressor. Push-in connection type needed changing to hook up systems. No leaks observed. Air pressure set too high. External engineer returned on second day to fix gas regulator to control air pressure – All OK.

11 – Installation Report

Client:	University of Bologna		
Quotation Number:	16875	Date:	15/05/2024
Job Number:	IN1365	Date:	03/07/2025

Tuned up system using CO₂ ref gas from cylinder & positioned eMagnet as required. CO₂ peak shape good. 2/1 stability good.

Tuned up system for CO₂ with trap setting of 150µA (named CO₂) & with trap setting at 600µA (named CO₂ 600). Also tuned up N₂ file to monitor background levels.

Ran CO₂ ref gas specs.

Precision run ~ 5 second ref gas pulses or REF & SAM, n=5

Linearity run ~ Ref 5 second pulses. SAM 1,2,4,6,8,10 second pulses, n=6

CO₂ Ref Gas (2/1) Peak Shape = Pass

Ref Gas CO₂ (¹³C) Precision = 0.019‰ S.D.

CO₂ (2/1) Stability = Pass

Ref Gas CO₂ (¹³C) Linearity = 0.043‰ S.D

All CO₂ REF GAS specs pass – All OK.

Setup prep system with laser ablation. User setup liquid nitrogen supply.

Iso-Cell fittings missing from delivery. Parts ordered and sent from Sercon HQ, out pending deliver.

Replacement ferrules found to fix lines to Iso-Cell and allow He through flow through ablation zone.

Issue with cryo-loop freezing. This caused over pressurisation error within Teledyne laser, which cuts off helium flow at a back-pressure of 19PSI. Investigate issue. Moisture must be entering the plumbing from atmosphere to be present. Adjusted connected on combustion tube fittings and cryo-loop fittings. Shortened cryo-loops as they were too low when installing LN₂ bucket and catching loops.

Adjusted inlet He tube on push-in fitting on laser.

Freezing lines did not reoccur, how ever pressure changes noted during batch runs. Advise user to monitor He pressure (from laser) during batch runs. If line blockages reoccur. Check helium connections within laser with advise from Teledyne.

Engineer advises that HS2022 and Cryo-LA be fitted to separate helium cylinder from the Teledyne laser

Adjusted flows and pressure through GC column. 16PSI on screen give approx. 4ml/min through GC column to MS sample isolation valve. Flow from laser set to 20ml/min – All OK.

Chromatography peaks from samples broader than desired. Removed flow meter on GC line as not in use, also this improved sample peak sharpness – All OK.

Ran serval test batches. Laser ablates as expected – All OK.

Setup methods for RGI mode, normal mode & normal mode with ref gas pulse for monitoring purposes.

11 – Installation Report

Client:	University of Bologna		
Quotation Number:	16875	Date:	15/05/2024
Job Number:	IN1365	Date:	03/07/2025

Cellulose (RGI mode) n=4 test batch 01 = 0.066% S.D.

Cellulose (normal mode) n=4 test batch 01 = 0.268% S.D.

Cellulose (normal mode) n=5 test batch 02 = 0.444% S.D.

Sample peak drift issues noted during "normal mode" batches.

For sample ablation the following settings were used.

Laser output = 12.6%, Fluence = 2.50 J/cm², Rep Rate 10, circle size = 200µm

Sample peak height approx. 18nA (major beam).

Trap @ 600µA (CO2 600 tune file).

GC flow approx. = 4ml/min (Pressure = 16psi)

Laser/Cryo carrier flow = 20ml/min (Pressure 16.4psi)

Gave over-view IR-MS training, explaining function of mass spec & prep unit components – All OK.

Gave training on theory and methodology for all units - All OK.

Gave Callisto, Callisto Reprocessor - All OK.

Left HS2022 & Callisto manuals on desktop of PC.

Gave sample prep and reaction tube training - All OK.

Advised on annual oils change and filament change schedule requirements - All OK.

Install complete.



11 – Installation Report

Client:	University of Bologna		
Quotation Number:	16875	Date:	15/05/2024
Job Number:	IN1365	Date:	03/07/2025

Recommendations:

- Investigate air compressor for leaks.
- Monitor flows and pressures via laser software.
- Advise to fit separate He cylinders on Teledyne laser & Sercon systems to help with back-pressure fluctuations.

Faults and Shortages:

- Connections missing from Iso-Cell. Parts sent from Sercon, pending delivery.

Follow up:

N/A

Engineer: David Harris

Date: 7th November 2025

Signed:

Paola Cipriacchini



Sercon Ltd, Europa House, Coppicemere Drive,
Crewe, Cheshire CW1 6GZ, UK
Tel: +44 (0)1270 580008
Company Registration No. 4290072 Vat No. 771 1100 74

Certificate - 12

12 – Installation Acceptance and Warranty Certificate

Client:	University of Bologna		
Quotation Number:	16875	Date:	15/05/2024
Job Number:	IN1365	Date:	03/07/2025

Contact:	Rossella Guerrieri, Paola Gioacchini
System:	HS2022, Cryo-LA, Teledyne 213 Laser
Software:	Callisto v500.0.2, Reprocessor v50.0.0
Engineer:	David Harris
Installation Date:	7 th November 2025

Warranty commences:	7 th November 2025
Warranty Expires:	7 th November 2027

Customer Acceptance:

Name: PAOLA GIOACCHINI

Signature: Paola Gioacchini

Date: 7-11-2025

Notes:

N/A

Engineer's Signature:

On behalf of Sercon Limited

Name: David Harris

Signature: [Signature]

Date: 7th November 2025